

REMARKS

Claims 1-15 and 33-47 were pending in this application, with claims 16-32 withdrawn from consideration. By way of this preliminary amendment that accompanies a Request for Continued Examination (RCE), claim 1, 2, 7, 10, 12, 14, 15, 33, 34, 39, 42, 44, 46 and 47 have been amended, claims 11, 35 and 43 have been canceled without prejudice or disclaimer, and claims 48, 59 and 50 have been added. Accordingly, Applicants submit claims 1-10, 12-15, 33, 34, 36-42 and 44-50 are presently pending for consideration.

An important feature of the present invention is the collecting of steam generated in a gasification cycle in an IGCC, after that steam has been used to cool a high-temperature portion of a gas turbine. The present invention serves to improve the cooling effect of a gas turbine by returning the above-mentioned steam to the gasification cycle. See, for example, cooling steam recovery path 43 as shown in Figures 13 and 14 of the drawings, which provides the cooling steam (used to cool the gas turbine) to the steam turbine.

Presently pending independent claims 1 and 33 have been amended to more clearly distinguish the present invention from the art cited in the Office Action mailed August 28, 2002.

In particular, claim 1 has been amended (and claim 33 has been amended in a similar manner) to recite that:

at least a portion of said steam from said heat exchanger is supplied to at least one high-temperature section of said gas turbine which is at a temperature higher than a temperature of said steam from said heat exchanger, so as to cool said at least one high temperature section of said gas turbine, and

wherein the at least a portion of said steam, after having cooled said at least one high-temperature section of said gas turbine, is collected and provided to a steam turbine of said steam turbine system, to be used, along with said steam output by said heat recovery system, to generate steam in a steam cycle.

None of the cited art of record discloses, teaches or suggests the above-mentioned features. That is, none of the cited art of record collects steam that has been generated in a gasification cycle and that has been used to cool a high-temperature portion of a gas turbine, wherein the collected steam is returned to the gasification cycle to be used to cool the gas turbine at a later time.

New claims 48, 49 and 50 have been added to recite additional features of the present invention that are believed to be separately patentable. Please note that new claim 50 has been written to explicitly recite a feature that was not given patentable weight by the Examiner, as the Examiner stated in a Continuation Sheet to an Advisory Action dated November 22, 2002.

Applicants respectfully submit that the application is in condition for allowance, and entry and reconsideration based on the instant amendment and reply is earnestly solicited. Should the Examiner have any questions or suggestions regarding this application, the Examiner is invited to contact the undersigned attorney at the telephone number shown below.

Respectfully submitted,

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Date

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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 19-0741 for any such fees; and applicant(s) hereby petition for any needed extension of time.

MARKED UP VERSION TO SHOW CHANGES**Marked-Up Claims:**

1. (Four Times Amended) An integrated coal gasification combined cycle power generator (IGCC) comprising:

a coal gasification system for producing a combustible gas from coal in a coal gasification cycle, wherein said coal gasification system supplies said combustible gas to a gas turbine system;

said gas turbine system comprises a gas turbine for performing expansion work using said combustible gas, wherein said gas turbine supplies exhaust gas to a heat recovery system;

said heat recovery system performs heat exchange, wherein said heat recovery system uses said exhaust gas supplied from said gas turbine as a heat source, and supplies steam generated in the heat exchange to a steam turbine system;

said steam turbine system performs expansion work, said steam turbine system comprising a condenser to condense said steam from said heat recovery system into water, said water being supplied to a heat exchanger in said coal gasification system[, where] so that said water is heated to steam, and wherein at least a portion of said steam from said heat exchanger is supplied to [more than] at least one high-temperature section of [the] said gas turbine [system] which [are] is at a temperature higher than a temperature of said steam from said heat exchanger, so as to cool said at least one high temperature section of said gas turbine, and

wherein the at least a portion of said steam, after having cooled said at least one high-temperature section of said gas turbine, is collected and provided to a steam turbine of said steam turbine system, to be used, along with said steam output by said heat recovery system, to generate steam in a steam cycle.

2. (Three Times Amended) An IGCC according to claim 1, wherein a higher-temperature steam is produced after cooling said [more than] at least one high-temperature section of the gas turbine system with said steam from said

heat exchanger, said higher-temperature steam is recovered from said [more than] at least one high-temperature section of the gas turbine system and supplied to [a] said steam turbine in said steam turbine system.

7. (Three Times Amended) An IGCC according to claim 6, wherein said gas turbine system comprises an air compressor that supplies air to said at least one of said more than one high-temperature section of the gas turbine system for the purpose of cooling said at least one [of said more than one] high-temperature section, producing a higher-temperature air, and wherein

said higher-temperature air is recovered after cooling said at least one of said more than one high-temperature section and supplied to said heat recovery system.

10. (Three Times Amended) An IGCC according to claim 1, wherein a higher-temperature steam is produced after cooling said [more than] at least one high-temperature section of [the] said gas turbine [system] with said steam from said heat exchanger, and wherein

said higher-temperature steam is recovered from said [more than] at least one high-temperature section of [the] said gas turbine [system] and supplied to said heat recovery system.

12. (Amended) An IGCC according to claim [11] 10, further comprising a gasification substance producing unit in said coal gasification system for producing an oxygen gas and a nitrogen gas from air, said gasification substance producing unit being adapted to supply said oxygen gas to a coal gasification unit, wherein

said coal gasification unit is adapted to receive said oxygen gas from said gasification substance producing unit and to receive coal from a coal supplying unit,

said coal gasification unit burns the coal from said coal supplying unit with the oxygen gas from said gasification substance supplying unit, producing a combustible gas and introducing said combustible gas into a cooling unit,

said cooling unit cools the combustible gas from said coal gasification unit, said cooling unit being in fluid connection with a gas cleanup unit, and said gas cleanup unit removes impurities from said combustible gas.

14. (Three Times Amended) An IGCC according to claim 10, wherein air generated in an air compressor in said gas turbine system is supplied to at least one [of said more than one] high-temperature section of [the] said gas turbine [system] for the purpose of cooling said at least one [of said more than one] high-temperature section, producing a higher-temperature air, said higher-temperature air is recovered after cooling said at least one [of said more than one] high-temperature section and supplied to said heat recovery system.

15. (Twice Amended) An IGCC according to claim 10, wherein said higher-temperature steam is recovered from said [more than] at least one high-temperature section of [the] said gas turbine [system] and supplied to said heat recovery system and to said steam turbine.

33. (Twice Amended) An integrated coal gasification combined cycle power generator (IGCC) comprising:

a coal gasification system for producing a combustible gas from coal in a coal gasification cycle, wherein said coal gasification system supplies said combustible gas to a gas turbine system;

said gas turbine system comprises a gas turbine for performing expansion work using said combustible gas, wherein said gas turbine supplies exhaust gas to a heat recovery system;

said heat recovery system performs heat exchange, wherein said heat recovery system uses said exhaust gas supplied from said gas turbine as a heat source, and supplies steam generated in the heat exchange to a steam turbine system;

said steam turbine system performs expansion work, said steam turbine system comprising a condenser to condense said steam from said heat recovery system into water, said water being supplied to a heat exchanger in said coal

gasification system[, where] so that said water is heated to steam, wherein at least a portion of said steam from said heat exchanger is supplied to at least one high-temperature section of [the] said gas turbine [system] which is at a temperature higher than a temperature of said steam from said heat exchanger so as to cool said at least one high-temperature section, and wherein high-pressure from an air compressor in said gas turbine system is supplied to cool [the] said at least one high-temperature section of [the] said gas turbine [system] if steam is not yet generated by said heat exchanger in said coal gasification system, and

wherein the at least a portion of said steam, after having cooled said at least one high-temperature section of said gas turbine, is collected and provided to a steam turbine of said steam turbine system, to be used, along with said steam output by said heat recovery system, to generate steam in a steam cycle.

34. (Amended) An IGCC according to claim 33, wherein a higher-temperature steam is produced after cooling said at least one high-temperature section of [the] said gas turbine [system] with said steam from said heat exchanger, said higher-temperature steam is recovered from said at least one high-temperature section of [the] said gas turbine [system] and supplied to [a] said steam turbine in said steam turbine system.

39. (Amended) An IGCC according to claim 38, wherein the air compressor in said gas turbine system supplies air to said at least one high temperature section of [the] said gas turbine [system] for the purpose of cooling said at least one high-temperature section, producing a higher-temperature air, and wherein

said higher-temperature air is recovered after cooling said at least one high-temperature section and supplied to said heat recovery system.

42. (Amended) An IGCC according to claim 33, wherein a higher-temperature steam is produced after cooling said at least one high-temperature

section of [the] said gas turbine [system] with said steam from said heat exchanger, and wherein

said higher-temperature steam is recovered from said at least one high-temperature section of [the] said gas turbine [system] and supplied to said heat recovery system.

44. (Amended) An IGCC according to claim 43, further comprising a gasification substance producing unit in said coal gasification system for producing an oxygen gas and a nitrogen gas from air, said gasification substance producing unit supplying said oxygen gas to a coal gasification unit in said coal gasification system, wherein

said coal gasification unit receives said oxygen gas from said gasification substance producing unit and receives coal from a coal supplying unit,

said coal gasification unit burns the coal from said coal supplying unit with the oxygen gas from said gasification substance supplying unit, producing said combustible gas and introducing said combustible gas into a cooling unit in said coal gasification system,

said cooling unit cools the combustible gas from said coal gasification unit, said cooling unit being in fluid connection with a gas cleanup unit in said coal gasification system, and

said gas cleanup unit removes impurities from said combustible gas.

46. (Twice Amended) An IGCC according to claim 42, wherein air generated in an air compressor in said gas turbine system is supplied to said at least one high temperature section of [the] said gas turbine [system] for the purpose of cooling said at least one high-temperature section of [the] said gas turbine [system], producing a higher-temperature air, said higher-temperature air is recovered after cooling said at least one high-temperature section of [the] said gas turbine [system] and supplied to said heat recovery system.

47. (Amended) An IGCC according to claim 42, wherein said higher-temperature steam is recovered from said at least one high-temperature section

of [the] said gas turbine [system] and supplied to said heat recovery system and to said steam turbine.

48. (New) An IGCC according to claim 1, wherein said at least one high-temperature section of said gas turbine includes at least one of:

a gas turbine nozzle blade;
a gas turbine rotor blade; and
a gas turbine rotor.

49. (New) An IGCC according to claim 33, wherein said at least one high-temperature section of said gas turbine includes at least one of:

a gas turbine nozzle blade;
a gas turbine rotor blade; and
a gas turbine rotor.

50. (New) An IGCC according to claim 33, further comprising:
means for providing the high-pressure air from said air compressor in said gas turbine system to cool said at least one high-temperature section of said gas turbine,

wherein said means for providing only provides the high-pressure air to said at least one high-temperature section of said gas turbine when steam is not generated by said heat exchanger in said coal gasification system.